

DEPARTMENT OF AGRICULTURE, BENGAL.

ANNUAL REPORT

OF THE

CHINSURAH AGRICULTURAL STATION

FOR THE YEAR

1912-13.



CALCUTTA :

THE BENGAL SECRETARIAT BOOK DEPÔT.

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CONTENTS.

	PAGE
1. INTRODUCTION	1
2. SITUATION AND BRIEF HISTORY	} 2
3. AREA	
4. IRRIGATION	
5. CHARACTER OF THE SOIL	
6. METEOROLOGY	3
7. TEMPERATURES	4
8. OPERATIONS DURING THE YEAR—	
A.—General crops grown	6
B.—Experimental work	8
C.—Conservation of cattle-dung	} 16
D.—Distribution of seed	
E.—Practical training of young men	
9. RECEIPTS AND EXPENDITURE	} 17
10. ACKNOWLEDGMENTS	
11. MANAGEMENT AND INSPECTION	

ANNUAL REPORT OF THE CHINSURAH AGRICULTURAL STATION FOR THE YEAR 1912-13.

1.—INTRODUCTION.

This farm is typical of Lower Bengal and is particularly suited to winter rice and jute. Sugarcane can be grown, but the heaviness of the soil makes cultivation very difficult and costly. The work on this farm then will be restricted to these two crops in future and in addition to experimental work on each crop a large supply of seed will be produced for distribution purposes.

There are still many permanent improvements that can be done, but these will be taken up gradually as time and money are available.

The year under report was favourable to winter rice and jute and excellent crops of each were grown on large enough areas, to excite the admiration of many of the neighbouring raiyats, who came to inspect the crops several times.

Financially the farm did very well. The receipts not only paid for the ordinary expenditure of the farm, but also for all the establishment charges as well. During the year, April to March 1912-13, the receipts were Rs. 10,117-15-9, while expenditure, including cattle food, establishment and ordinary farm expenditure, was only Rs. 9,272-2-3. To the Farm Superintendent, Babu Tara Nath Roy, is due all credit for this result. Such a result has never been obtained before on a Government Farm in Bengal. I have no doubt Tara Babu will improve on these figures in the future.

So far as experimental work is concerned we are still dealing with ununiform conditions, but as a result of the work at this farm we can recommend Nagra paddy as a medium-grained variety and Dadkhani paddy as a fine-grained variety

of winter rice, while we can recommend Hooghly *deshi* jute, an Olitorius variety, and Java or Mauritius canes to the cultivators of this district. The district is too damp for cotton and cultivators will find it more economical to grow other crops such as jute or bananas instead of cotton.

This station has a seed store for seeds, manures and implements for the Burdwan Division, but owing to the apathy of the public the Superintendent has little work in this respect. The District Engineer will shortly build us a well at this farm which will be a great blessing.

2.—SITUATION AND BRIEF HISTORY.

The farm is situated in latitude 22°53' north and longitude 85°27' east and to the west of the East Indian Railway line between the Chinsurah and Hooghly Railway Stations. It is 38 feet above sea-level. The station was opened in 1908 and is representative of Lower Bengal. There are still some permanent improvements to be made before the farm can be said to be laid out properly.

3.—AREA.

The area is 202·3 acres, excluding the steading and tank on the south-west corner. Of the 202·3 acres nearly 170 acres are under cultivation, and the remainder is occupied by roads, channels, tanks and *jhils*.

4.—IRRIGATION.

The farm has to depend almost entirely on the natural rainfall. The tank and the *jhil* on the eastern side supply some water for irrigation during winter, but they dry up during the hot months, and with the present channels the water can only be employed economically on neighbouring plots.

5.—CHARACTER OF THE SOIL.

The soil is mostly clay loam, excepting a piece of land on the south-west corner which is loamy. The soil is representative of the Gangetic alluvium in Bengal on the west side of the river Hooghly.

The following table shows analyses of the soil and sub-soil of this farm:—

	High land soil No. 1 A, Lab. No. 144.	High land sub-soil No. 1 B, Lab. No. 145.	Block A soil (field No. 2 A), Lab. No. 146.	Block A sub-soil 2 B, Lab. No. 147.	Medium soil No. 3 A, Lab. No. 148.	Medium sub-soil No. 3 B, Lab. No. 149.	Low land soil (field No. 4 A), Lab. No. 150.	Low land sub-soil No. 4 B, Lab. No. 151.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Insoluble silicate and silica.	77.25	...	71.20	...	67.00	...	63.38	...
* Combined water and organic matter.	5.29	...	5.05	...	8.33	...	9.59	...
Ferric oxide and alumina.	14.77	...	20.14	...	21.48	...	22.84	...
Lime ... ..	.96	...	1.53	...	1.00	...	1.57	...
Magnesia ... ..	.31	...	.26	...	.55	...	1.75	...
Potash ... ..	.85	1.63	1.29	1.22	1.31	1.17	1.51	1.01
Soda ... ..	.55	...	.39	...	.27	...	.27	...
† Phosphoric anhydride.	.12	.15	.22	.10	.06	.12	.09	.12
Total ...	100.00	...	99.98	...	100.00	...	100.00	...
* Containing nitrogen	.09	.073	.091	.088	.091	.064	.134	.132
† Containing phosphoric anhydride soluble in 1 per cent. citric acid solution.	.014	...	.016	...	.005	...	.007	...

From the above figures it will be seen that the soil is a very fertile one.

6.—METEOROLOGY.

The following table shows the normal average rainfall at the Sadar with the actual rainfall and number of rainy days recorded on the farm in 1912-13:—

Months.	Normal average rainfall at Sadar.	Actual rainfall, 1912-13.	Actual number of rainy days, 1912-13.
April	2.46	4.87	6
May	5.85	7.25	10
June	10.56	5.45	8

Months.			Normal average rainfall at Sadar.	Actual rainfall 1912-13.	Actual number of rainy days, 1912-13.
July	...	...	11.28	12.34	22
August	...	...	11.64	7.28	19
September	...	...	8.40	6.25	7
October	...	...	4.09	6.18	7
November	...	...	0.66	.75	2
December	...	...	0.19	...	...
January	...	...	0.38	...	...
February	...	...	1.20	4.78	9
March	...	...	1.58	1.84	2
Total			58.29	56.99	92

The year 1912 was meteorologically very favourable for jute and winter rice at Chinsurah. Early and sufficient rain fell in April and May to allow of early sowing of jute and timely preparation of the land for winter rice. The short rainfall in June allowed of thorough weeding of jute, while the normal rain in July allowed of transplanting of winter rice and did not flood out the jute. The good rain in October allowed the winter rice to flower properly and the retentive power of the soil allowed the crop to come to full maturity.

7.—TEMPERATURES.

The following table shows the average maximum and minimum temperature in Fahrenheit in the open and in the shade at this

farm for the year, the highest temperature recorded during the year in the shade being 106° in the month of May and the lowest 49° in the month of December:—

Months.		Average maximum outside.	Average minimum. outside.	Average maximum inside.	Average minimum inside.
1912.					
April	...	98	77	87	80
May	...	97	79	97	80
June	...	97	82	87	83
July	...	93	81	86	81
August	...	92	77	86	81
September	...	96	80	88	81
October	...	96	74	85	78
November	..	85	61	77	68
December	...	84	54	69	59
1913.					
January	...	84	54	70	58
February	...	86	62	73	66
March	...	93	69	82	72

8.—OPERATIONS DURING THE YEAR.

A. General crops grown.—The following table gives the area, total outturn and yield per acre of crops grown for seed supply and other purposes:—

Crop.	Area.	Total outturn.	Yield per acre.	REMARKS.
	Acres.	Mds.	Mds.	
Aman paddy ...	102.12	2,223 $\frac{1}{4}$	21 $\frac{1}{5}$	Good.
Jute: ...	23	270 $\frac{3}{8}$	11 $\frac{7}{8}$	In addition to fibre 7 $\frac{3}{4}$ mds. of jute seeds were also obtained.
Sugarcane ...	2.47	126 $\frac{1}{2}$	51 $\frac{1}{4}$	
Dhaincha seed ...	11.95	16	...	Destroyed by cyclone of November.
Dhaincha green manure.	34.9	Green manured	...	
Sunn hemp green manure.	7.01	Do.	...	
Soy beans ...	1.9	12 $\frac{1}{2}$	6 $\frac{1}{3}$	Poor.
Aus paddy ...	1.8	12 $\frac{3}{4}$	7 $\frac{1}{9}$	Poor.

The following table of individual outturns of winter rice speaks for itself. An average outturn of 28 $\frac{1}{4}$ maunds of grain

per acre from 53 acres of the Nagra variety fully proves the superiority of this, the favourite local variety of winter rice:—

Average outturn per acre of varieties of paddy grown at the Chinsurah Farm, 1912-13.

Serial No.	Variety.	Area. Acres	Average outturn per acre.
1	Nagra	53	28 $\frac{1}{4}$
2	Banktuli	17	22 $\frac{1}{3}$
3	Hatisal	12	18
4	Dadkhani	14	17 $\frac{1}{4}$
5	Badshabhog	3	18

Highest outturns obtained on acre plots.

Plot No.	Variety.	Area. Acres.	Outturn per acre.
B $\frac{1-5}{b}$	Nagra	1	33
B $\frac{1-5}{c}$	Do.	1	32
A $\frac{3-7}{b}$	Do.	1	30
B $\frac{6-10}{c}$	Do.	1	30 $\frac{1}{2}$
A Block (C Line).	Do.	3	30 $\frac{1}{2}$
B Block (A Line).	Do.	4	28 $\frac{1}{4}$

The average outturn of 12 maunds of jute fibre per acre from 23 acres gives a wrong impression altogether of the jute crop as grown on this farm in 1912. Several acres of the crop were phenomenal. I have never seen such a tall crop in my experience. Several acres reached 12 feet high. Some of the plots I valued at 25 maunds per acre. It is well known how the individual cultivator only grows one or two bighas of jute which receive extremely careful cultivation. One has to be, therefore, very careful in order to obtain acre blocks better than the raiyat's crop. When we grow better crops than the raiyats they soon come to see for themselves and to ask for seed, and many cultivators came to see our jute crop at Chinsurah in 1912.

The only definite figures, however, that I have been able to obtain of this crop are:—

	Area.	Outturn per acre.
(a) Red <i>deshi</i> jute (Hooghly)	·8 acres	20 $\frac{3}{4}$ maunds.
(b) Ditto (ditto)	·93 „	19 $\frac{1}{4}$ „
(c) Ditto (ditto)	2 „	18 $\frac{5}{8}$ „
(d) Dholeswar (Finlow's)	1 „	17 $\frac{7}{8}$ „

The Hooghly *deshi* is *Olitorius* while Dholeswar is *Capsularis*. Hence the local variety must still be considered the most suitable for this district.

B. Experimental work—

- | | | |
|------------------|--|------------------|
| (i) Winter rice. | \| | (iii) Sugarcane. |
| (ii) Jute. | | (iv) Soy beans. |

(i) *Winter rice*

- | | | |
|--------------|--|----------------|
| (a) Manure. | \| | (d) Seedlings. |
| (b) Variety. | | (e) Spacing. |
| (c) Ploughs. | | |

(i) (a) *Manure experiment*.—The following table shows the manures tried on *aman* paddy and the results obtained for the last four years. The results shown for each year is the

average of two plots. In order to understand the results it should be remembered that in the first year, *i.e.*, 1909-10, the rainfall was sufficient and the outturns were better than those of the next two years during which rainfall was much below normal. In the first year the unmanured plots yielded outturns that were rather high for such plots showing that the land was fairly rich when experiments were begun.

In the year under report two more manures were added, *viz.*, (1) Nitrolim, and (2) castor cake. It will be seen that the unmanured plots are being gradually impoverished, and the superiority of all the nitrogenous manures is becoming more and more perceptible.

Serial No.	MANURES PER ACRE.	AVERAGE OUTTURN PER ACRE.							
		1909-10.		1910-11.		1911-12.		1912-13.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
1	Unmanured	27½	36	13½	21	13½	19½	21½	20½
	1 Mds.								
2	Cowdung 50	28½	38½	18½	21½	23½	35½	24½	38½
3	Cowdung 100	31½	47½	18½	20½	18½	25½	23½	37½
	Cowdung 50								
4	Super 5	33	52½	13½	23½	22½	33	25½	38½
	Saltpetre 1								
5	Bonemeal 3	30½	50	17½	26½	18½	42½	25½	34½
	Saltpetre 1								
6	Dhaincha green manure ...	*26½	34½	21½	26½	16½	23	29½	46½
7	Sunn hemp green manure...	*24½	30½	27	30	16½	23½	29½	38½
8	Unmanured	30	42½	14½	16½	19	28½	22½	30½
	Mds.								
9	Nitrolim 2 ... ..	...	...	...	...	...	...	27½	37½
10	Castor-cake 5 ... ..	...	...	...	...	...	...	24½	34

The striking features of this table are that:—First, there is no appreciable difference in yield from an application of an extra application of 50 maunds of cowdung per acre. Fifty maunds of cowdung per acre has always given as large an outturn as any other application of cowdung in Bengal. Second, green manuring of dhaincha and sunn hemp increases the yield very perceptibly. Third, the other applications are, economically speaking, poor in comparison with green manures.

The following outturns from acre plots are very interesting and show that the land of this farm is very rich:—

	Grain. Mds.	Straw. Mds.
(1) Unmanured	27 $\frac{3}{8}$	32 $\frac{1}{4}$
(2) Two hundred maunds cowdung per acre	33	43 $\frac{1}{2}$
(3) Dhaincha green manured ...	31 $\frac{7}{8}$	41 $\frac{1}{8}$
(4) Sunn hemp ,, ...	30 $\frac{1}{2}$	42 $\frac{7}{8}$
(5) Nitrolim 2 maunds per acre	28 $\frac{3}{4}$	30 $\frac{1}{2}$

(b) *Variety experiment.*—During the first two years nine varieties of paddy were tried. In 1911 the experiment was restricted to the five superior varieties. The following table shows the results for the last four years:—

Serial No.	NAME OF VARIETY.	AVERAGE OUT-TURN PER ACRE, 1909-10.		* OUTTURN PER ACRE, 1910-11.		AVERAGE OUT-TURN PER ACRE, 1911-12.		AVERAGE DUPLICATE PLOT, 1912-13.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
1	Dadkhani ...	19 $\frac{1}{2}$	24	9 $\frac{1}{2}$	16 $\frac{1}{2}$	17 $\frac{1}{2}$	25 $\frac{1}{2}$	18 $\frac{1}{2}$	23 $\frac{1}{2}$
2	Badshabhogo	20 $\frac{1}{2}$	35	12 $\frac{1}{2}$	17 $\frac{1}{2}$	20 $\frac{1}{2}$	37	16 $\frac{1}{2}$	26 $\frac{1}{2}$
3	Banktulsu ...	18 $\frac{1}{2}$	29 $\frac{1}{2}$	9 $\frac{1}{2}$	15 $\frac{1}{2}$	18 $\frac{1}{2}$	31 $\frac{1}{2}$	21 $\frac{1}{2}$	31 $\frac{1}{2}$
4	Hatisal ...	19	26 $\frac{1}{2}$	10 $\frac{1}{2}$	16 $\frac{1}{2}$	12 $\frac{1}{2}$	36	22	36 $\frac{1}{2}$
5	Nagra ...	29 $\frac{1}{2}$	32 $\frac{1}{2}$	9	16 $\frac{1}{2}$	19 $\frac{1}{2}$	29 $\frac{1}{2}$	21 $\frac{1}{2}$	24 $\frac{1}{2}$

* Nagra is the standard paddy of this locality and is cultivated on by far the largest area. Its grain is white and of medium quality. Hatisal and Banktulsu are finer and sell higher than Nagra by about 2 annas per maund of paddy. Dadkhani and Badshabhogo sell 4 annas higher.
† In 1910-11 the duplicate plots could not be transplanted.

The local variety Nagra will be found to be the best on the whole.

(c) *Plough experiments.*—The Sibpur, Meston, Hindusthan and local ploughs were compared for the last three years and results are shown below:—

Serial No.	NAME OF PLOUGH.	AVERAGE OUT-TURN PER ACRE, 1909-10.		* OUTTURN PER ACRE, 1910-11.		AVERAGE OUT-TURN PER ACRE, 1911-12.		1912-13.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.		
1	Local ...	26 $\frac{1}{2}$	42 $\frac{1}{2}$	15	16 $\frac{1}{2}$	18 $\frac{1}{2}$	30 $\frac{1}{2}$	} Not tried	
2	Hindusthan ...	27 $\frac{1}{2}$	27 $\frac{1}{2}$	14 $\frac{1}{2}$	15 $\frac{1}{2}$	15 $\frac{1}{2}$	23 $\frac{1}{2}$		
3	Meston ..	28 $\frac{1}{2}$	35	13 $\frac{1}{2}$	55 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{1}{2}$		
4	Sibpur ...	27 $\frac{1}{2}$	37 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$	11 $\frac{1}{2}$	17 $\frac{1}{2}$		

* In 1910-11 the duplicate plots could not be transplanted.

(d) *Seedling experiment.*—The transplanting of one, two and four seedlings was compared during the last three years. The results confirm what was said last year, *i.e.*, in order that one seedling may give its maximum return transplanting should be done sufficiently early to allow the plant to tiller to its greatest capacity.

In the first year one seedling gave the highest outturn, but in the second year, when transplanting had to be postponed to the end of August, four seedlings gave the highest outturn. In the third year transplanting was done in July, and one seedling again gave the highest outturn. In 1912 again transplanting was late and again four seedlings were best. The following table shows the average results for 1909, 1911, 1912 and of original plots only for 1910, in which year the duplicate plots could not be transplanted : —

Serial No.	NUMBER OF SEEDLINGS TRANSPLANTED 10 INCHES APART.	AVERAGE OUT-TURN PER ACRE, 1909-10.		OUTTURN PER ACRE, 1910-11.		AVERAGE OUT-TURN PER ACRE, 1911-12.			
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
1	1 Seedling ...	31½	33½	8½	9½	19	39	20½	21½
2	2 Seedlings ...	25½	31½	12	14½	16	31½	22	27½
3	3 Do. ...	24½	28½	13½	16½	17½	36½	30½	38½

To determine up to what date transplanting of one seedling may succeed, one seedling was transplanted on 7 different plots every week from the first week of July. The results shown below are striking and explain why one seedling has not been successful in many cases:—

ONE SEEDLING TRANSPLANTING IN—				First week July.	Second week July.	Third week July.	Fourth week July.	First week August.	Second week August.	Third week August.
Outturn per acre in maunds.	Grain	...	...	32½	27½	22½	24½	21½	18½	17½
	Straw	...	...	34	32	27	26	23½	21½	18½

(e) *Spacing experiment.*—Two spacings were tried in transplanting *aman* paddy, one 6 inches apart both ways and another 10 inches apart. In one set 1 seedling was transplanted and

in another set 2 seedlings. The results for 1909 and 1911 are given below. In 1910 this experiment could not be tried on account of short rainfall.

In the year under report the experiment was modified by trying three spacings 6 inches, 12 inches and 14-inches instead of two and transplanting only one seedling. If 14-inch spacing gives as good a result as 6-inch or 12-inch which it did during the year under report, then obviously it would economise both labour and seed to adopt that spacing. It remains to be seen, however, if there is a time limit. The following are the figures:—

Serial No.	PARTICULARS.	AVERAGE OUTTURN PER ACRE.							
		1909-10.		1910-11.		1911-12.		1912-13.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		Mds.	Mds.			Mds.	Mds.	Mds.	Mds.
1	1 Seedling 6 inches apart	26 $\frac{1}{2}$	36 $\frac{1}{2}$	} Could not be tried. }		17 $\frac{1}{2}$	33	21 $\frac{1}{2}$	23 $\frac{1}{2}$
2	" 10 " " " ...	28 $\frac{3}{8}$	34 $\frac{5}{8}$			17 $\frac{1}{2}$	23 $\frac{1}{2}$	19 $\frac{1}{2}$	16 $\frac{5}{8}$
3	2 Seedlings 6 " " " ...	23 $\frac{1}{2}$	33 $\frac{1}{2}$			16 $\frac{1}{2}$	33 $\frac{3}{8}$	20 $\frac{1}{2}$	26 $\frac{1}{2}$
4	" 10 " " " ...	24 $\frac{3}{8}$	31 $\frac{1}{2}$			15 $\frac{1}{2}$	22 $\frac{5}{8}$	...	...

Aus paddy—Variety experiment.—Cowdung 50 maunds per acre:—

	Acre.	Outturn.	Yield per acre.
C. P. Aus	$\frac{1}{6}$	2	10
Kala Aus (local coarse) ...	...	1 $\frac{1}{3}$	5 $\frac{5}{13}$

This land is not suited to *aus paddy* one year in five.

(ii) *Jute*—

(a) Manures. | (b) Variety.

All the experimental figures for this crop show that we are dealing with ununiform conditions. I give below the figures for reference:—

TABLE I.

				Acre.	Outturn.	Yield per acre.
(a) <i>Manures</i> —						
(1)	Unmanured	...	...	$\frac{1}{5}$	$1\frac{7}{8}$	$9\frac{3}{8}$
(2)	Cowdung	...	100 mds.	$\frac{1}{5}$	$1\frac{3}{4}$	$8\frac{3}{4}$
(3)	Castor cake	...	10 „	$\frac{1}{5}$	$2\frac{1}{2}$	$12\frac{1}{2}$
(4)	{ Cowdung	...	50 „	}	$\frac{1}{5}$	17
	{ Super	...	3 „			
	{ Saltpetre	...	1 „			
(5)	Unmanured	..	...	$\frac{1}{5}$	$3\frac{3}{8}$	$16\frac{7}{8}$

Schröder Smidt's manurial tests:—1st.

TABLE II.

				Acre.	Outturn.	Yield per acre.
					Mds.	Mds.
(1)	Unmanured	...	...	$\frac{1}{10}$	$\frac{2}{5}$	4
(2)	{ Muriate of Potash	200 lbs.	}	$\frac{1}{10}$	$1\frac{1}{2}$	15
	{ Super	200 „				
	{ Sulphate of Ammonia	100 „				
(3)	{ Super	200 „	}	$\frac{1}{10}$	$1\frac{5}{8}$	$16\frac{1}{4}$
	{ Sulphate of Ammonia	100 „				
(4)	Muriate of Potash	200 „		$\frac{1}{10}$	1	10

Schröder Smidt's manurial test :—2nd.

Half the quantities were applied as compared with the first experiment.

TABLE III.

				Acre.	Outturn.	Yield per acre.
					Mds.	Mds.
(1)	Unmanured	...	...	$\frac{1}{10}$	$1\frac{1}{2}$	15
(2)	{ Muriate of Potash ... 100 lbs. }			$\frac{1}{10}$	1	10
	{ Super ... 100 „ }					
	{ Sulphate of Ammonia 50 „ }					
(3)	{ Super ... 100 „ }			$\frac{1}{10}$	$1\frac{1}{10}$	11
	{ Sulphate of Ammonia 50 „ }					
	{ Muriate of Potash ... 100 „ }					
(b) Variety—						
(1)	Local red	...	...	$\frac{1}{10}$	$1\frac{3}{8}$	$13\frac{3}{4}$
(2)	Deswal	...	...	$\frac{1}{10}$	$1\frac{5}{8}$	$16\frac{1}{4}$
(3)	Kakya Bombai ..	...	...	$\frac{1}{10}$	2	20
(4)	Dhaleswar (from Dacca)	...	...	$\frac{1}{10}$	$1\frac{7}{8}$	$18\frac{3}{4}$

(iii) *Sugarcane* —

(a) Manures.

|

(b) Variety.

This crop is a minor crop on this farm, but the following figures are interesting:—

				190.	1911.	1912.
				Mds.	Mds.	Mds.
(a) Manures—						
One-tenth acre plots—						
(1)	Cowdung ...	100	}	41 $\frac{3}{8}$	52 $\frac{1}{4}$	48 $\frac{1}{4}$
	Sulphate of Ammonia	2				
	Sulphate of Potash ...	2				
	Super ...	3				
(2)	Cowdung ...	100	}	40	57 $\frac{3}{4}$	50
	Sulphate of Ammonia ...	2				
	Super ...	3				
(3)	Cowdung ...	100	}	30 $\frac{5}{8}$	43 $\frac{5}{8}$	36 $\frac{1}{2}$
	Potash ...	2				
(4)	Cowdung ...	100	}	30	46 $\frac{3}{8}$	40
	Super ...	3				
(5)	Cowdung ...	100	}	35 $\frac{3}{4}$	54 $\frac{7}{8}$	41 $\frac{1}{2}$
	Super ...	3				
	Saltpetre ...	2				

(b) Variety—

One-fourth acre plots—				Mds.
(1)	Shamshara ...	...	...	38 $\frac{1}{2}$
(2)	Java ..	...	...	90
(3)	Mauritius red	...	...	80 $\frac{9}{10}$
(4)	Khari . . .	...	...	54 $\frac{1}{2}$

Java and Mauritius canes are very heavy yielders and suit Bengal admirably.

(iv) *Soy beans*.—This crop grows well on ordinary jute land, but is not likely to replace the fibre crop. The following yields were obtained :—

	Mds.
(1) Kalimpong white	12 $\frac{5}{8}$ per acre.
(2) Black Sabour	15 „
(3) White Sabour	18 $\frac{3}{4}$ „

C. Conservation of cattle dung.—The cowdung is being conserved on this farm in *kutch*a pits. The same will be compared with raiyats' cowdung. So far there are no figures for publication.

D. Distribution of seeds.—The following seeds were distributed from this farm during the year under report :—

	Mds.
Central Provinces fine <i>aus</i> paddy ...	13
Jute seed	11 $\frac{1}{4}$
Dhaincha seed	5
Banktuli	11
Dadkhani	15 $\frac{7}{8}$
Badshabhoge	6 $\frac{1}{8}$
Lentil	5 $\frac{3}{4}$
Mustard	$\frac{1}{2}$
Gram	$\frac{1}{2}$
Sunn hemp seed	1
Soy beans	Nil.

E. Practical training of young men.—Government has sanctioned four apprentices for this farm. Six young men joined, but went away when they found they had to do practical work. Three young men are now being trained.

9. *Receipts and expenditure.*—During the year ending March 31st, 1913, the following receipts were obtained at this farm:—

			Rs.	A.	P.
Sale proceeds	...	...	9,903	11	3
Bills receivable (Sibpur seed store)			214	4	6
Total			10,117	15	9

Expenditure—

Ordinary farm expenditure	...	...	6,479	10	7
Cattle food	...	...	180	1	0
Establishment	...	...	2,612	6	8
Total			9,272	2	3

10.—ACKNOWLEDGMENT.

The station is indebted to C. Somers Taylor, Esq., B.A., Agricultural Chemist to the Government of Bihar, for the soil analyses.

11.—MANAGEMENT AND INSPECTION.

This station belongs entirely to Government and is managed by the Agricultural Department, Bengal. During the period under report Babu Tara Nath Roy was the Superintendent in charge. He worked well and deserves every credit for the economical working of this station. The Deputy Director of Agriculture, Bengal, made frequent inspections, and the Director of Agriculture, Bengal, visited the station twice during the year.

F. SMITH,

Deputy Director of Agriculture, Bengal.

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

RESEARCH REPORT

ON THE THEORY OF THE

RELATIONSHIP BETWEEN

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THE VOLUME OF A

SUBSTANCE

BY

JOHN EDGAR HOOVER

PH.D. THESIS

1912

CHICAGO, ILL.

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